

Exhibit 12

IEEE Std 100-1996

The IEEE Standard Dictionary of Electrical and Electronics Terms

Sixth Edition

**Standards Coordinating Committee 10, Terms and Definitions
Jane Radatz, Chair**

This standard is one of a number of information technology dictionaries being developed by standards organizations accredited by the American National Standards Institute. This dictionary was developed under the sponsorship of voluntary standards organizations, using a consensus-based process.

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Introduction

Since the first edition in 1941 of the American Standard Definitions of Electrical Terms, the work now known as IEEE Std 100, The IEEE Standard Dictionary of Electrical and Electronics Terms, has evolved into the unique compendium of terms that it is today.

The current edition includes all terms defined in approved IEEE standards through December 1996. Terms are categorized by their technical subject area. They are also associated with the standards or publications in which they currently appear. In some cases, terms from withdrawn standards are included when no current source can be found. Earlier editions of IEEE Std 100 included terms from sources other than IEEE standards, such as technical journals, books, or conference proceedings. These terms have been maintained for the sake of consistency and their sources are listed with the standards in the back of the book.

The practice of defining terms varies from standard to standard. Many working groups that write standards prefer to work with existing definitions, while others choose to write their own. Thus terms may have several similar, although not identical, definitions. Definitions have been combined wherever it has been possible to do so by making only minor editorial changes. Otherwise, they have been left as written in the original standard.

Users of IEEE Std 100 occasionally comment on the surprising omission of a particular term commonly used in an electrical or electronics field. This occurs because the terms in IEEE Std 100 represent only those defined in the existing or past body of IEEE standards. To respond to this, some working groups obtain authorization to create a glossary of terms used in their field. All existing, approved standard glossaries have been incorporated into this edition of IEEE Std 100, including the most current glossaries of terms for computers and power engineering.

IEEE working groups are encouraged to refer to IEEE Std 100 when developing new or revised standards to avoid redundancy. They are also encouraged to investigate deficiencies in standard terms and create standard glossaries to alleviate them.

The sponsoring body for this document was Standards Coordinating Committee 10 on Definitions (SCC10), which consisted of the following members:

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control store

(2) A facility that provides the individual responsible for controlling the simulation and that provided the capability to implement simulation control as PDU's on the DIS network.

(C/DIS) 1278.3-1996

control store (software) In a microprogrammed computer, the computer memory in which microprograms reside. *See also:* microword; nanostore. (C) 610.10-1994, 610.12-1990

control structure (software) A construct that determines the flow of control through a computer program. *See also:* computer program; conditional control structure; flow of control. (C/SE) 729-1983s

control switch A manually operated switching device for controlling power-operated devices. *Note:* It may include signaling, interlocking, etc., as dependent functions.

(PE/SWG) C37.100-1992

control switchboard A type of switchboard including control, instrumentation, metering, protective (relays) or regulating equipment for remotely controlling other equipment. Control switchboards do not include the primary power circuit-switching devices or their connections.

(PE/SWG) C37.100-1992, C37.21-1985r

control-switching point (telephone switching systems) A switching entity arranged for routing and control in the distance dialing network, at which intertoll trunks are interconnected.

(COM) 312-1977w

control system (1) (broadly) An assemblage of control apparatus coordinated to execute a planned set of controls. *See also:* control. (IA) [60]

(2) A system in which a desired effect is achieved by operating on the various inputs to the system until the output, which is a measure of the desired effect, falls within an acceptable range of values. *See also:* closed-loop control system; control; network analysis; open-loop control system; transfer function. (MAG/PEL) 111-1984w, 264-1977w

(3) **(automatic control)** A system in which deliberate guidance or manipulation is used to achieve a prescribed value of a variable. *Note:* It is subdivided into a controlling system and a controlled system. (PE) [3]

(4) A system in which a desired effect is achieved by operating on inputs until the output, which is a measure of the desired effect, falls within an acceptable range of values. *See also:* automatic control; closed-loop control; open-loop control. (C/MAG) 264-1977w, 610.2-1987

control system, adaptive A control system within which automatic means are used to change the system parameters in a way intended to improve the performance of the control system. *See also:* control system, feedback.

(IA/IM/PE) [120], [3], [60], [69]

control system, automatic A control system that operates without human intervention. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, automatic feedback A feedback control system that operates without human intervention. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, cascade A control system in which the output of one subsystem is the input for another subsystem. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, closed-loop A control system in which the controlled quantity is measured and compared with a standard representing the desired performance. Any deviation from the standard is fed back into the control system in such a sense that it will reduce the deviation of the controlled quantity from the standard. *Note:* In automatic generation control, the controlled quantities are frequency, unit generation, and net interchange. (PE) 94-1970w

control system, coarse-fine A control system that uses some elements to reduce the difference between the directly controlled variable and its ideal value to a small value and that uses other elements to reduce the remaining difference to a smaller value. (IA) [60]

control system, dual-mode A control system in which control alternates between two predetermined modes. *Note:* The con-

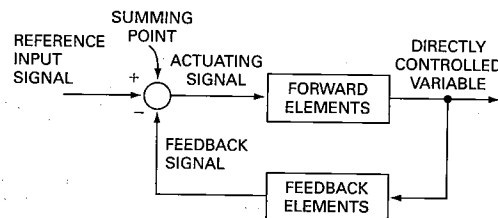
control system, ratio

dition for change from one mode to the other is often a function of the actuating signal. One use of dual-mode action is to provide rapid recovery from large deviations without incurring large overshoot. *See also:* control system, feedback.

(PE) [3]

control system, duty factor (automatic control) A control system in which the signal to the final controlling element consists of periodic pulses whose duration is varied to relate, in some prescribed manner, the time average of the signal to the actuating signal. *Note:* This mode of control differs from two-step control in that the period of the pulses in duty-factor control is predetermined. (PE) [3]

control system, feedback (1) (general) A control system that operates to achieve prescribed relationships between selected system variables by comparing functions of these variables and using the comparison to effect control. *See the diagram below.*



Simplified block diagram indicating essential elements of an automatic control system.

control system, feedback

(Std100)

(2) **(speed governing of hydraulic turbines)** A closed-loop or feedback control system is a control system in which the controlled quantity is measured and compared with a standard representing the desired value of the controlled quantity. In hydraulic governors, any deviation from the standard is fed back into the control system in such a sense that it will reduce the deviation between the controlled quantity and the standard providing negative feedback. (PE) 125-1977s

control system, floating (automatic control) A control system in which the rate of change of the manipulated variable is a continuous (or at least a piecewise continuous) function of the actuating signal. *Note:* The manipulated variable can remain at any value in its operating range when the actuating signal is zero and constant. Hence the manipulated variable is said to "float." When the forward elements in a control loop have integral control action only, the mode of control has been called "proportional-speed floating." The use of the term integral control action is recommended as a replacement for "proportional-speed floating control." *Synonym:* floating control. *See also:* control action, integral; control system, multiple-speed floating; control system, single-speed floating; neutral zone. (PE) [3]

control system, multiple-speed floating (automatic control) A form of floating control system in which the manipulated variable may change at two or more rates each corresponding to a definite range of values of the actuating signal.

(PE) [3]

control system, multi-step *See:* control system, step.

control system, on-off A two-step control system in which a supply of energy to the controlled system is either on or off. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, positioning (automatic control) A control system in which there is a predetermined relation between the actuating signal and the position of a final controlling element. *Note:* In a "proportional-position control system" there is a continuous linear relation between the value of the actuating signal and the position of a final controlling element. (PE) [3]

control system, ratio (automatic control) A system that maintains two or more variables at a predetermined ratio. *Note:* Frequently some function of the value of an uncontrolled vari-

control system, sampling

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conventionally true value

able is the command to a system controlling another variable.
(PE) [3]

control system, sampling Control using intermittently observed values of signals such as the feedback signal or the actuating signal. *Note:* The sampling is often done periodically. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, single-speed floating (automatic control) A floating control system in which the manipulated variable changes at a fixed rate, increasing or decreasing depending on the sign of the actuating signal. *Note:* A neutral zone of values of the actuating signal, in which no action occurs, may be used. (PE) [3]

control system, step (automatic control) A system in which the manipulated variable assumes discrete predetermined values. *Note:* The condition for change from one predetermined value to another is often a function of the value of the actuating signal. When the number of values of the manipulated variable is two, it is called a two-step control system; when more than two, a multi-step control system. (PE) [3]

control system, two-step A control system in which the manipulated variable alternates between two predetermined values. *Note:* A control system in which the manipulated variable changes to other predetermined value whenever the actuating signal passes through zero is called a two-step single-point control system. A two-step neutral-zone control system is one in which the manipulated variable changes to the other predetermined value when the actuating signal passes through a range of values known as the neutral zone. The neutral zone may be produced by a mechanical differential gap. The neutral zone is also called overlap, and two-step neutral-zone control overlap control. *See also:* control system, feedback. (IM/PE) [120], [3]

control system, two-step neutral zone *See:* control system, two-step.

control system, two-step single-point *See:* control system, two-step.

control tape *See:* carriage control tape.

control terminal (base station) (mobile communication) Equipment for manually or automatically supervising a multiplicity of mobile and/or radio stations including means for calling or receiving calls from said stations. *See also:* mobile communication system. (VT) [37]

control total *See:* hash total.

control track (electroacoustics) A supplementary track usually placed on the same medium with the record carrying the program material. *Note:* Its purpose is to control, in some respect, the reproduction of the program, or some related phenomenon. Ordinarily, the control track contains one or more tones, each of which may be modulated either as to amplitude, frequency, or both. *See also:* phonograph pickup. (SP) [32]

control transfer instruction *See:* jump instruction.

control transformers (power and distribution transformers) Step-down transformers generally used in circuits which are characterized by low power levels and which contribute to a control function, such as in heating and air conditioning, printing, and general industrial controls. (PE) C57.12.80-1978r

control unit (1) (digital computers) The parts that effect the retrieval of instructions in proper sequence, the interpretation of each instruction, and the application of the proper signals to the arithmetic unit and other parts in accordance with this interpretation. (C) [20], [85]

(2) (mobile communication) (mobile station) Equipment including a microphone and/or handset and loudspeaker together with such other devices as may be necessary for controlling a mobile station. *See also:* mobile communication system. (VT) [37]

(3) A functional unit of a computer that interprets and executes the instructions of a program in a prescribed sequence *See also:* instruction control unit; main control unit. (C) 610.10-1994

control valve (control systems for steam turbine-generator units) Those valves that control the energy input to the turbine and that are actuated by a controller through the control mechanism. (PE) 122-1985s

control variable *See:* loop-control variable.

control voltage The voltage applied to the operating mechanism of a device to actuate it, usually measured at the control power terminals of the mechanism. (PE/SWG) C37.100-1992

control winding (1) (rotating machinery) An excitation winding that carries a current controlling the performance of a machine. *See also:* asynchronous machine. (PE) [9]

(2) (saturable reactor) A winding by means of which a controlling magnetomotive force is applied to the core. *See also:* magnetic amplifier. (EEC/PE) [119]

convection current In an electron stream, the time rate at which charge is transported through a given surface. *See also:* electron emission. (ED) [45], 161-1971w

convection-current modulation The time variation in the magnitude of the convection current passing through a surface, or the process of directly producing such a variation. *See also:* electron emission. (ED) 161-1971w

convection heater A heater than dissipates its heat mainly by convection and conduction. (EEC/PE) [119]

convective discharge (effluve) (electrical wind) (medical electronics) (static breeze) The movement of a visible or invisible stream of particles carrying away charges from a body that has been charged to a sufficiently high voltage. (EMB) [47]

convective heat release The heat contained in the hot gases produced in a fire. (DEI) 1221-1993

convenience outlet *See:* receptacle.

convention Any practice that is not formally standardized, but which is adopted by a group in a given situation. For example, programmers usually adopt the convention of indenting subordinate instructions in a routine so that the structure of the program is more easily visualized. *See also:* standard. (C) 610.10-1994, 610.7-1995

conventional BIL (basic lightning impulse insulation level) The crest value of a standard lightning impulse for which the insulation shall not exhibit disruptive discharge when subjected to a specific number of applications of this impulse under specified conditions, applicable specifically to non-self-restoring insulations. (C/PE) 1313.1-1996

conventional BSL (basic switching impulse insulation level) The crest value of a standard switching impulse for which the insulation does not exhibit disruptive discharge when subjected to a specific number of impulses under specified conditions, applicable to non self-restoring insulations. (C/PE) 1313.1-1996

conventional deviation of the disruptive discharge voltage (z) The difference between the 50% and 16% disruptive discharge voltages. (PE) 4-1995

conventional-electrode coaxial detector (germanium gamma-ray detectors) A coaxial detector in which the outer contact is an n-type layer. (NPS) 325-1986s

conventionally (true value of a quantity) The commonly accepted best estimate of the value of that quantity. This and its associated uncertainty will normally be determined by a national or transfer standard, or by a reference instrument that has been calibrated against a national or transfer standard, or by measurement quality assurance (MQA) with a national laboratory or qualified secondary laboratory. (NI) N42.17B-1989r

conventionally cooled (rotating machinery) A term referring to windings in which the heat generated within the principal portion of the windings must flow through the major ground insulation before reaching the cooling medium. (PE/REM) [115], [9]

conventionally true value The best estimate of the value determined by a primary or secondary standard, or by a reference instrument that has been calibrated against a primary or secondary standard. (NI) N42.20-1995

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